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Impact of Team Attitude and Behavior on IS Project Success

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ABSTRACT

Although the success rate of information systems (IS) projects has increased over the past two decades, the result is still far from satisfactory. To improve IS project success rate, this study proposes a research model to examine IS project performance from a team attitude and behavior perspective. A total of 91 IS projects were collected by an online survey from CIOs/CTOs/IT professionals. The collected data were analyzed by using AMOS 7.0. We found, via hypotheses testing, that (1) A project team's goal commitment is positively related to its teamwork quality, (2) A project team's goal commitment is positively related to IS project success, and (3) A project team's teamwork quality is positively related to IS project success. Managerial implications to IS project practitioners were discussed.

INTRODUCTION

Information technology (IT) is an ever-increasing resource with which an organization can create and sustain its competitive advantages (Powell & Micallef, 1997; Igbaria *et al.*, 1998; Shuit, 2004). Organizations attempt to use IS projects as enablers to perform business activities for providing better products or services. However, an IS project is a two-edged sword. A triumph example is evidenced by General Motors shortening the design-to-production time by 30 months since 1996 via an IS project for digitalization of the engineering process (Nash, 2003). A well documented breakdown failure of an IS project is the computerized baggage handling system at the Denver International Airport, which delayed the opening of the airport by 16 months and went over budget by about \$2 billion (Montealegre & Keil, 2000).

A number of studies have been conducted to improve IS project performance from the project team's perspective (Henderson & Lee, 1992; Robey *et al.*, 1993; Aladwani, 2002). Such studies

demonstrated that managing an IS project team systematically and scientifically can contribute to successful completion of the project. According to the CHAOS reports (The Standish Group, 1994; 2004), the IS project success rate increased from 16% in 1994 to 34% in 2004. Although such existing theories as project management, systems development life cycle management, and project risk management might have contributed to significant improvements in the overall IS project success rate, about two-thirds of all IS projects still belong to failed or challenged categories in 2004 and it seems too difficult to increase the overall IS project success rate further. Consequently, researchers need to carry out more empirical studies about how to achieve IS project success. Given the importance of IS projects and the unsatisfactory IS project success rate, this study attempts to examine factors of achieving IS project success from the team attitude and behavior perspective by incorporating teamwork quality a well-known construct but not being related to IS project success directly and empirically.

The rest of the paper is organized as follows. Section 2 describes the literature review as a theoretical foundation and presents the research model. The research methodology is discussed in Section 3. Section 4 then presents data analysis and discusses results. The last section concludes the contributions of this study as well as addresses limitations and future research directions.

THEORETICAL DEVELOPMENT AND RESEARCH MODEL

An IS project is unambiguously regarded as an enabler of change for today's organizations. In general, an IS project is intended to develop information systems used to deploy business processes and services successfully. Among IS project success studies, Henderson and Lee (1992) argued that managerial and team member controls can affect IS project performance. A conflict model proposed by Robey et al. (1993) stated that project team members' participation, influence, conflict, and conflict resolution have direct or indirect effects on IS project success. Prior work has also demonstrated that the impact of interpersonal conflict and conflict management (Barki & Hartwick, 2001) and both internal and external team conflicts (Wang et al., 2005) on IS project performance. Aladwani (2002) studied IS project performance by integrating theories of IS, organizational teams, and project management and found that support technologies, management advocacy, and clear goals have direct effects on IS project performance but project-team size and staff expertise have indirect effects on it via problem solving competency. Other researchers, such as Barki and Hartwick (1994), Marble (2003), and Wang et al. (2006), have shed some lights on the impact of management commitment and control on IS project performance. Chan et al. (2008) found that project team task skills can facilitate application and development skills, resulting in IS project success. Research into the effect of organizational citizenship behaviors (OCB) of project teams on IS project success has suggested that the project team's OCB influences IS project success through integration climate and effective project management (Yen et al., 2008).

Locke et al. (1984) studied the effect of goals on task performance and established the relationship between goal commitment and task performance. Hollenbeck and Klein (1987)

integrated expectancy theory into the goal commitment process and examined the moderator effect of goal commitment between goal level and task performance. They divided antecedents of goal commitment into attractiveness of goal attainment and expectancy of goal attainment. Most importantly, the positive relationship between expectancy of goal attainment and goal commitment was proposed in their study. Hollenbeck et al. (1989b) identified situational factors (goal publicness and goal origin) and personal factors (need for achievement and locus of control) as antecedents of goal commitment. Renn (2003) mainly tried to uncover the interactive effect of feedback and goal commitment on task performance. He found that the relationship between task feedback-performance is positive only if the task recipient has a high goal commitment. These research studies investigated the moderate effect of goal commitment instead of direct effect on performance, but it revealed that goal commitment is an indispensable factor for studying task performance from the task recipient's attitude perspective. Multiple studies have generalized goal commitment as commitment to yield insightful results about how to achieve IS project success. For instance, Sabherwal et al. (2003) examined escalating commitment in the context of two simulated information systems project experiments and concluded that "commitment to an information systems (IS) development project is essential for systems success." Butler (2005) utilized a case study to show that individual, group, and institutional commitments influence a sales and marketing information systems development process. Given 10 perceived factors to contribute to IS success, project team commitment was perceived as the second most important factor to IS success (Fowler & Horan, 2007). All these studies have clearly showed the importance of goal commitment to IS project success.

In order to attain the desirable performance of a team-based project, good teamwork is the key to open the door of success. Hoegl and Gemuenden (2001) conceptualized teamwork quality into six facets (communication, coordination, balance of member contributions, mutual support, effort, and cohesion) and they found that teamwork quality has significant relationships to both team performance (effectiveness and efficiency) and personal success (work satisfaction and learning). Introduced and validated in the information systems research, teamwork quality was adopted by Easley et al. (2003) to relate a collaborative system to team performance. Specifically, a group communication support system (GCSS) mediates the relationship between teamwork quality and team performance. Several studies (Hoegl & Proserpio, 2004; Hoegl & Parboteeah, 2006; Hoegl & Parboteeah, 2007) investigated teamwork quality further in innovative projects from different perspectives, namely team member proximity, team autonomy, and domain-relevant and creative-thinking skills. Along the same line of thinking, Hoegl et al. (2007) examined the influence of team member dispersion on the relationship between teamwork quality and team performance.

Based on the above literature, an IS project success research model is proposed and shown in Figure 1.



Figure 1: Research Model.

According to the nature of team activities, Sundstrom (1999) categorized teams into six types (production team, service team, management team, project team, action team, and parallel team). This study concentrates on the project team that is to develop a one-time output. Consequently, in the research model, an IS project team refers to the team for developing, installing, and implementing computer systems and applications in an organization. We define goal commitment as the level of an IS project team's determination and persistence put toward achieving the project goal. The goal commitment construct is an important and necessary team attitude because it not only affects IS project success but also connects to team behavior. Thus, there are two consequences of goal commitment, including team behavior and project performance. Generally, high goal commitment of an IS project team stimulates team members to work harder, thus increasing teamwork quality which is the interactions quality within the team. Ultimately, the team can get the IS project done more effectively, efficiently, and satisfactorily. Considering task outcomes (effectiveness and efficiency) and psychological outcomes (satisfaction) as IS project performance criteria (Aladwani, 2002), we define IS project success as the extent to which an IS project team completes the project effectively and efficiently with the satisfaction of teamwork. Specifically, it includes team's fulfilment of features and functions originally specified; compliance with expected amount of work, budget, and schedule; and completion with expected satisfaction. Accordingly, the following hypotheses were deduced to test the relationships proposed in the research model:

- H1: A project team's goal commitment is positively related to its teamwork quality.
- H2: A project team's goal commitment is positively related to IS project success.
- H3: A project team's teamwork quality is positively related to IS project success.

RESEARCH METHODOLOGY AND DATA COLLECTION

A survey method was used to collect data. According to the enumerating reasons for the popularity of survey research (Newsted et al., 1998), the advantages of using the survey research method for this study are listed as follows:

- Based on the collected data from survey research, the hypothesized relationships among variables can be determined by appropriate statistical techniques;
- It is easy to administrate survey research and code the collected data; and
- Survey results can be generalized to the rest of the studied population and replicated to the similar situations.

To measure all constructs in this study adequately, we adapted the existent and validated items from previous research. Seven items were adapted from Robey et al. (1993) and Aladwani (2002) studies to tap effectiveness, efficiency, and satisfaction of IS project success. Based on the teamwork quality instrument proposed by Hoegl and Gemuenden (2001), we adopted eight items to measure teamwork quality. Five items for goal commitment were adapted from the measurement scale used and validated in several studies (Leifer & McGannon, 1986; Hollenbeck et al., 1989a; Renn et al., 1999). All these measurement items used a 7-point Likert scale ranging from 1 (strongly disagree/very low) to 7 (strongly agree/very high). A pre-test of the survey questions was conducted to improve the clarity and content validity by a focus group of five business Ph.D. students, two computer science Ph.D. students, one liberal arts Masters student, three MIS faculty members, one MBA faculty member, and one IT staff member.

About 680 organizations' CIO/CTOs were randomly selected from an on-line commercial database (http://www.lead411.com/) using different criteria in terms of number of employees, annual sales, and industry and 20 organizations' senior IT professionals were chosen from one of the authors' social network. Since there are many advantages for using an online survey such as economy, time savings, and easier data transfer, this study adopted the online survey hosted by SurveyMonkey (http://www.surveymonkey.com/). These 700 survey subjects were contacted via e-mail messages and requested to answer the questionnaire about their most recently completed IS project developed in their firm and 95 CIO/CTOs' e-mails were invalid or undeliverable addresses, resulting in an effective sample of 605.

A total of 106 responses were received and 91 were usable for the data analysis. Given that one of the web-based survey's limitations is the difficulty of sampling of e-mail address (Dillman, 2000), the response rate (15.04%) is acceptable. Chi-square tests were implemented to rule out non-response bias by comparing early respondents with late respondents, as recommended by Compeau & Higgins (1995). The respondents mainly represent 9 different industries. Therefore,

industry bias is not an issue and computer/software firms and banking/finance/insurance firms account for 26.92% and 19.23% of the respondents, respectively. This could likely be caused by an elevated interest by these firms' respondents who developed IS projects more frequently and commonly.

DATA ANALYSIS RESULTS AND DISCUSSION

Data analysis was carried out by AMOS 7.0 for structural equation modeling with the maximum likelihood estimation (MLE) procedure. Typically, structural equation modeling comprises a two-step analysis. First, reliability and validity of a measurement model that represents the adequacy of items to measure constructs are assessed. Second, a structural model illustrating hypothesized relationships among the constructs is assessed.

First, the measurement model for the three latent constructs was assessed by confirmatory factor analysis. In this study, Chi-square statistic was not used because it varies with the sample size. Therefore, GFI, AGFI, NFI, CFI, and RMSEA were used to measure goodness of fit. For a good model fit, GFI, NFI, and CFI should be greater than 0.9, AGFI should be greater than 0.8, and RMSEA should be between 0.05 and 0.08 (Brown & Cudeck, 1993; Teo et al., 2003). The standardized loadings indicated that all items' loadings are greater than the acceptable level of 0.7 (Nunnally, 1978) except Item4 of teamwork quality (0.464) and Item7 of IS project success (0.063). The model fit indices demonstrated that the measurement model has a poor model fit. Specifically, GFI (0.763), AGFI (0.702), NFI (0.793), CFI (0.882), and RMSEA (0.106) were below their acceptable levels.

Second, the measurement model was modified by removing Item4 of teamwork quality and Item7 of IS project success and then re-examined for the model fit. The model fit indices (GFI=0.901, AGFI=0.836, NFI=0.921, CFI=0.951, and RMSEA =0.063) indicated that the measurement model has been improved and the modified measurement model had a good model fit. Consequently, three research hypotheses were tested by the size and the significance of the path coefficients in the structural model. Figure 2 depicts the structural model results. Hence, H1 and H2 were supported at p<0.001 and H3 was supported at p<0.05. Additionally, goal commitment explained 65.6% of the variance of teamwork quality. 88.1% of the variance of IS project success was explained by goal commitment and teamwork quality.



Figure 2: The structural model results.

A couple of theoretical implications can be derived from this reserach. First, there are three views of IS project management in the literature: the social and organizational view, the technical view, and the integrated view. The social and organizational view considers social and organizational factors to be more important than technical factors in IS project development (Doherty & King, 1998a; 1998b). This study provides a research model to the social and organizational view from the team attitude and behavior perspective by relating teamwork quality to IS project success directly. Second, the teamwork quality construct was successfully related to goal commitment and IS project success in this study so that it can be utilized further in the IS project success research field.

This study also provides practical managerial implications to IS project practitioners such as CIO/CTOs and project team leaders about how to achieve IS project success, and ultimately to improve the overall project success rate. The findings suggest that motivated team members and high teamwork quality can increase IS project success rate. Hence, CIO/CTOs should pay more attention to IS project teams and place more effort and resources to boost the teams' goal commitment and teamwork. Additionally, project team leaders may motivate their team members by proposing a reasonable project reward scheme and promote the teamwork by providing organizational IT infrastructure capabilities such as technical IT infrastructure services.

CONCLUSION

Given the unsatisfactory IS project success rate, the most notable contribution of this study is that the well-known teamwork quality construct was directly related to IS project success in the research model as well as empirically demonstrated its positive relationship to IS project success. The linkage between goal commitment and teamwork quality is considered not only a bridge to connect team attitude and team behavior, but also a hinge to make the research model more integrative. The results indicate that both goal commitment (regarded as team attitude) and teamwork quality (regarded as team behavior) have a significantly positive relationship with IS project success. Both direct and indirect positive relationships between goal commitment and IS project success highlight the importance of team attitude to complete an IS project successfully.

However, one possible limitation of this research is that the sample size is probably under-represented with regard to the total number of IS projects developed in different industries. Hence, more studies may be necessary in order to generalize the results of the research for a variety of different industries. Another potential limitation is that all IS projects analyzed in the study were the most recently completed IS projects in firms. Although this method makes it easy for respondents to identify a specific IS project, the method cannot thoroughly grasp all of the different types of IS projects developed in diverse industries. Lastly, although a CIO/CTO is the person most likely to evaluate the IT project performance comprehensively, the IT project success was measured by the perceptions of the CIO/CTOs. As a result, there exist potential common source biases in the study. Accordingly, collecting perceptual data from such different stakeholders as managers, development team members, and end users on IT project success might provide more reliable and insightful results.

Future research may extend the research model by investigating six facets of the teamwork quality construct. This extension will facilitate the comparison of the importance of each facet to IS project success and lead to a higher overall teamwork quality, which in turn helps achieve IS project success. In order to further generalize the findings of this study, another future research direction could be to test the research model by collecting data on IS projects that can be defined differently, on such criteria as development methodology, project size, and project completion time. Doing so can reveal valuable interactions among the project team, IS project type, and IS project success.

REFERENCES

- Aladwani, A. (2002). An Integrated Performance Model of Information Systems Projects. Journal of Management Information Systems, 19(1), 185-210.
- Barki, H. & Hartwick, J. (1994). Measuring user participation, user involvement, and user attitude. *MIS Quarterly*, 18(1), 59-79.
- Barki, H. & Hartwick, J. (2001). Interpersonal conflict and its management in information system development. *MIS Quarterly*, 25(2), 195-228.
- Brown, M. & Cudeck, R. (1993). *Alternative Ways of Assessing Model Fit*. In K. A. Bollen & J. Long (Eds.). Testing Structural Equation Models. Newbury Park, CA: Sage. 136-162.
- Butler, T. (2005). Power Conflict, Commitment & the Development of Sales & Marketing IS/IT Infrastructures at Digital Devices, Inc. *Journal of Cases on Information Technology*, 7(3), 18-36.

- Chan, C. L., Jiang, J. J., & Klein, G. (2008). Team task skills as a facilitator for application and development skills. *IEEE Transaction on Engineering Management*, 55(3), 434-441.
- Compeau, D. & Higgins, C. (1995). Computer Self-Efficacy: Development of a Measure and Initial Test. *MIS Quarterly*, 19(2), 189-211.
- Dillman, D. (2000). Mail and Internet Surveys--The Tailored Design Method. New York: John Wiley & Sons, Inc.
- Doherty, N. F. & King, M. (1998a). The consideration of organizational issues during the system development process. *Behavior and Information Technology*, 17(1), 41-51.
- Doherty, N. F. & King, M. (1998b). The importance of organizational issues in systems development. *Information Technology and People*, 11(2), 104-123.
- Easley, R., Devaraj, S., & Crant, J. (2003). Relating Collaborative Technology Use to Teamwork Quality and Performance: An Empirical Analysis. *Journal of Management Information Systems*, 19(4), 247-268.
- Fowler, J. J. & Horan, P. (2007). Are Information Systems' Success and Failure Factors Related? An Exploratory Study. *Journal of Organizational and End User Computing*, 19(2), 1-22.
- Henderson, J. & Lee, S. (1992). Managing I/S Design Teams: A Control Theories Perspective. *Management Science*, 38(6), 757-777.
- Hoegl, M. & Gemuenden, H. (2001). Teamwork Quality and the Success of Innovative Projects: A Theoretical Concept and Empirical Evidence. *Organization Science*, 12(4), 435-449.
- Hoegl, M. & Parboteeah, K. P. (2006). Autonomy and teamwork in innovative projects. *Human Resource Management*, 45(1), 67-79.
- Hoegl, M. & Parboteeah, K. P. (2007). Creativity in innovative projects: How teamwork matters. *Journal of Engineering and Technology Management*, 24(1-2), 148-166.
- Hoegl, M. & Proserpio, L. (2004). Team member proximity and teamwork in innovative projects. *Research Policy*, 33(8), 1153-1165.
- Hoegl, M., Ernst, H., & Proserpio, L. (2007). How teamwork matters more as team member dispersion increases. *Journal of Product Innovation Management*, 24(2), 156-165.

- Hollenbeck, J. & Klein, H. (1987). Goal Commitment and the Goal-Setting Process: Problems, Prospects, and Proposals for Future Research. *Journal of Applied Psychology*, 72(2), 212-220.
- Hollenbeck, J., Klein, H., O'Leary, A., & Wright, P. (1989a). "Investigation of the Construct Validity of a Self-Report Measure of Goal Commitment." *Journal of Applied Psychology*, 74(6), 951-956.
- Hollenbeck, J., Williams, C., & Klein, H. (1989b). An Empirical Examination of the Antecedents of Commitment to Difficult Goals. *Journal of Applied Psychology*, 74(1), 18-23.
- Igbaria, M., Zinatelli, N., & Cavaye, A. (1998). Analysis of Information Technology Success in Small Firms in New Zealand. *International Journal of Information Management*. 18(2), 103-119.
- Leifer, R. & McGannon, K. (1986). *Goal Acceptance and Goal Commitment: Their Differential Impact on Goal Setting Theory*. Paper Presented at the Meeting of the Academy of Management.
- Locke, E., Frederick, E., & Bobko, P. (1984). Effect of Self-Efficacy, Goals, and Tasks Strategies on Task Performance. *Journal of Applied Psychology*, 69(2), 241-251.
- Marble, R. P. (2003). A system implementation study: Management commitment to project management. *Information & Management*, 41(1), 111-123.
- Montealegre, R. & Keil, M. (2000). De-Escalating Information Technology Projects: Lessons from the Denver International Airport. *MIS Quarterly*, 24(3), 417-447.
- Nash, K. (2003). 3 Triumphs, 3 Breakdowns. Baseline, 14, 22-23.
- Newsted, P., Huff, S., & Munro, M. (1998). Survey Instruments in Information Systems. *MIS Quarterly*, 22(4), 553-554.
- Nunnally, J. (1978). Psychometric Theory (2nd ed.). New York: McGraw-Hill.
- Powell, T. & Micallef, A. (1997). Information Technology as Competitive Advantage: The Role of Human, Business, and Technology Resources. *Strategic Management Journal*, 18(5), 375-405.
- Renn, R. (2003). Moderation by Goal Commitment of the Feedback-Performance Relationship: Theoretical Explanation and Preliminary Study. *Human Resource Management Review*, 13, 561-580.

- Renn, R., Danehower, C., Swiercz, P., & Icenogle, M. (1999). Further Examination of the Measurement Properties of Leither & McGannon's (1986) Goal Acceptance and Goal Commitment Scales. *Journal of Occupational and Organizational Psychology*, 72, 107-113.
- Robey, D., Smith, L., & Vijayasarathy, L. (1993). Perceptions of Conflict and Success in Information Systems Development Projects. *Journal of Management Information Systems*, 10(1), 123-139.
- Sabherwal, R., Sein, M., & Marakas, G. (2003). Escalating Commitment to Information Systems Projects: Findings from Two Simulated Experiments. *Information & Management*, 40(8), 781-798.
- Shuit, D. (2004). Companies See Gains in successful Software System Implementations. *Workforce Management*, 83(1), 55-56.
- Sundstrom, E. (1999). Supporting Work Team Effectiveness: Best Management Practices for Fostering High Performance. San Francisco: Jossey-Bass Publishers.
- Teo, H., Wei, K., & Bendasat, I. (2003). Predicting Intention to Adopt Interorganizational Linkage: an Institutional Perspective. *MIS Quarterly*, 27(1), 19-49.
- The Standish Group. (1994). The CHAOS Report. Retrieved July 9, 2008, from http://www.standishgroup.com/chaos_resources/index.php
- The Standish Group. (2004). The CHAOS Report. Retrieved July 9, 2008, from http://www.standishgroup.com/chaos_resources/index.php
- Wang, E. T. G., Chen, H. H. G., Jiang, J. J., & Klein, G. (2005). Interaction quality between IS professionals and users: impacting conflict and project performance. *Journal of Information Science*, 31(4), 273-282.
- Wang, E. T. G., Shih, S.-P., Jiang, J. J., & Klein, G. (2006). The relative influence of management control and user–IS personnel interaction on project performance. *Information and Software Technology*, 48(3), 214-220.
- Yen, H. R., Li, E. Y., & Niehoff, B. P. (2008). Do organizational citizenship behaviors lead to information system success? Testing the mediation effects of integration climate and project management. *Information & Management*, 45(6), 394-402.

APPENDIX—Survey Questionnaire Items

All information gathered in the survey will be kept confidential and anonymous and will be used for research purposes only. We are not requesting any sensitive or proprietary information.

Please indicate the commitment level (Very low-1 Medium-4 Very high-7) for the following statements that describe Goal Commitment (COMMIT).

In your honest opinion:

- 1. how hard did you try to achieve the project goal?
- 2. how persistent did you strive to attain the project goal?
- 3. how committed were you to achieving the project goal you were asked to try for?
- 4. how determined were you to reach your project goal?
- 5. how enthusiastic were you about attempting to achieve the project goal?

Please indicate the degree to which you agree or disagree (Strongly disagree-1 Neutral-4 Strongly agree-7) with the following statements that describe Teamwork Quality (TWQ) for the most recently completed IT project.

- 1. There was frequent communication within team.
- 2. Project-relevant information was shared openly by all team members.
- 3. The work done on subtasks within the project was closely harmonized.

4. The team recognized the specific potentials (strengths and weaknesses) of individual team members.

- 5. The team members helped and supported each other as best they could.
- 6. Every team member fully pushed the project.
- 7. It was important to the members of our team to be part of this project.
- 8. All members were fully integrated in our team.

Please indicate the degree to which you agree or disagree (Strongly disagree-1 Neutral-4 Strongly agree-7) with the following statements that describe the performance of the most recently completed IT project in your organization <u>AFTER</u> you evaluated it (ITPERM).

- 1. The team produced large amounts of work.
- 2. The team produced high quality of work.
- 3. The team operated efficiently.
- 4. The team adhered to the budget.
- 5. The team adhered to the schedule.
- 6. Team members are satisfied with the interactions with people inside and outside of the team.
- 7. Team members are satisfied with their work done in the project.